

# PATENT SPECIFICATION

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## (54) VACUUM CLEANERS

(71) We, GOBLIN (B.V.C.) LIMITED, a British Company, of Goblin Works, Ermyn Way, Leatherhead, Surrey, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to vacuum cleaners for removing dust, such as for example asbestos or other dust which could constitute an industrial or health hazard. Vacuum cleaners in accordance with this invention are particularly suitable for use in such places as factories and hospitals.

The object of this invention is to provide a vacuum cleaner having a readily replaceable filter element which serves to trap any minute dust particles entrained in the intake air to the cleaner. To this end according to this invention there is provided a vacuum cleaner incorporating a fabric filter bag adjacent the air intake thereof, such fabric filter bag being supplemented by a disposable paper filter bag arranged therein which paper bag is supported by a spider member extending across the mouth of the fabric filter bag, said spider member carrying a central tubular ring through which the neck of the paper filter bag is passed and against which the neck of the paper filter bag is clamped by a resilient washer secured to a spreader tube, which tube enters the neck of the paper bag.

According to a preferred feature of this invention the fabric filter bag is disposed in a canister provided with a closure lid having a connection for an intake hose and means adapted, on the lid being closed, to exert pressure on the washer to cause it positively to clamp the neck of the paper filter bag.

Conveniently the rim of the fabric filter bag and the spider are clamped within the canister by the closure lid.

A vacuum cleaner in accordance with a preferred embodiment of this invention will now be described in some detail, but purely by way of example, with reference to the accompanying drawings, in which:—

Figure 1 is a side elevation of the vacuum cleaner.

Figure 2 is an exploded perspective view, drawn on an enlarged scale, showing component parts of the main filtration unit of the vacuum cleaner.

Figure 3 is a central vertical section, drawn on a still larger scale, through the upper part of the main filtration unit after assembly of the component parts, and

Figure 4 is a fragmentary part-sectional view, also drawn on an enlarged scale of the exhaust filtration unit of the vacuum cleaner.

The main filtration unit includes a canister 1, the upper end of which is closed by a lid 2 detachably secured thereon by cam-action fastener means 3 and formed with a central inlet 4 for connection to an intake hose, not shown, for dust-laden air.

Clamped by the periphery of the lid 2 within an upper rim 5 of the canister 1 are the rim of a fabric filter bag 6, disposed within the canister, and the outer ends of the arms 7 of a spider member 8 which includes a central tubular ring 9 having an upper end.

Within the fabric filter bag 6 there is arranged a disposable paper filter bag 10, the neck of which is, in use, passed up through the central tubular ring 9 of the spider member 8 and secured by means which will now be described.

A metal spreader tube 11 which will enter the mouth of the paper filter bag 10 is secured at its upper end in a rubber washer 12 which extends outwardly over the upper end of the tubular ring 9. On the underneath face of the lid 2 there is provided a plate 13 which, when the lid is closed,

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bears down under pressure on the rubber washer 12.

To secure a paper filter bag 10 in position, the neck thereof is passed up through the central tubular ring 9 of the spider 8 and spread out over the upper end of the ring. The spreader tube 11 is inserted into the mouth of the paper filter bag 10 so that the rubber washer 12 traps the bag between it and the ring 9. Finally, the lid 2 is closed causing the plate 13 to bear down under pressure on the rubber washer 12 and thus positively to locate and clamp the neck of the paper filter bag 10. The cam action of the fastener means 3 serves to compress the rubber washer and thus ensures a positive seal for the neck of the paper filter bag 10.

When the vacuum cleaner is in use, dust carried in the incoming air stream is directed into the paper filter bag 10 for retention and ultimate safe disposal. On releasing the lid 2, and removing the spreader tube 11 with the rubber washer 12 and the spider 8, the paper filter bag 10 when filled, can easily be removed: normally the neck of the bag would first be folded over and then the bag would be lifted clear of the fabric bag 6 and disposed of. A fresh paper filter bag 10 is inserted in the fabric filter bag 6 and secured in position as before.

Air filtered by the paper filter bag 10 and the fabric filter bag 6 leaves the canister 1 through outlets 15 in its cylindrical wall and passes to an exhaust filtration unit 16 from which it is discharged to atmosphere at a low velocity. The exhaust filtration unit 16 preferably includes sub-units 17 each of which is preferably of the kind described in the Specification No. 1,340,955, that is to say it comprises (see Figure 4) a cylindrical housing 18 secured over an air outlet and provided with perforations 19 in its circumferential wall for the discharge of filtered air, and a replaceable cylindrical filter 20 arranged within the housing comprising a pleated filter element 21 through which air entering the sub-unit in an axial direction must pass radially before passing through the perforations 19 in the wall of the housing 18. Guard elements 22 are provided for the housings 18, each guard element being in the form of a part cylindrical shell extending outwardly away from the wall of the filtration unit 16 and serving to protect the upper regions of each housing 18 from accidental blows. The guard elements 22 are mounted on the housings 18 by means of lugs shown in Figure 4.

Attention is drawn to the claim of our co-pending Application No. 28228/74 (Serial No. 1396326) which is divided from the present application.

#### WHAT WE CLAIM IS:—

1. A vacuum cleaner incorporating a fabric filter bag adjacent the air intake thereof, such fabric filter bag being supplemented by a disposable paper filter bag arranged therein which paper bag is supported by a spider member extending across the mouth of the fabric filter bag, said spider member carrying a central tubular ring through which the neck of the paper filter bag is passed and against which the neck of the paper filter bag is clamped by a resilient washer secured to a spreader tube, which tube enters the neck of the paper bag.

2. A vacuum cleaner as claimed in Claim 1 wherein the fabric filter bag is disposed in a canister provided with a closure lid having a connection for an intake hose and means adapted, on the lid being closed, to exert pressure on the washer to cause it positively to clamp the neck of the paper filter bag.

3. A vacuum cleaner as claimed in Claim 2 wherein the rim of the fabric filter bag and the spider are clamped within the canister by the closure lid.

4. A vacuum cleaner as claimed in Claim 2 or 3 wherein the closure lid is detachably secured on the canister by cam-action fastener means.

5. A vacuum cleaner as claimed in Claim 2, 3 or 4 wherein the canister with its closure lid and the filter bag therein form a main filtration unit to which an exhaust filtration unit is connected, the arrangement being such that air filtered by the filter bag will leave the canister and pass to the exhaust filtration unit from which it will be discharged to atmosphere at low velocity.

6. A vacuum cleaner as claimed in Claim 5 wherein the exhaust filtration unit comprises at least one cylindrical housing secured over an air outlet from the canister and provided with perforations in its circumferential wall for the passage of exhaust air, and a replaceable filter arranged within the housing comprising a pleated filter element through which air must pass radially before passing through the perforations in the wall of the housing.

7. A vacuum cleaner substantially as herein described with reference to and as shown in the accompanying drawings.

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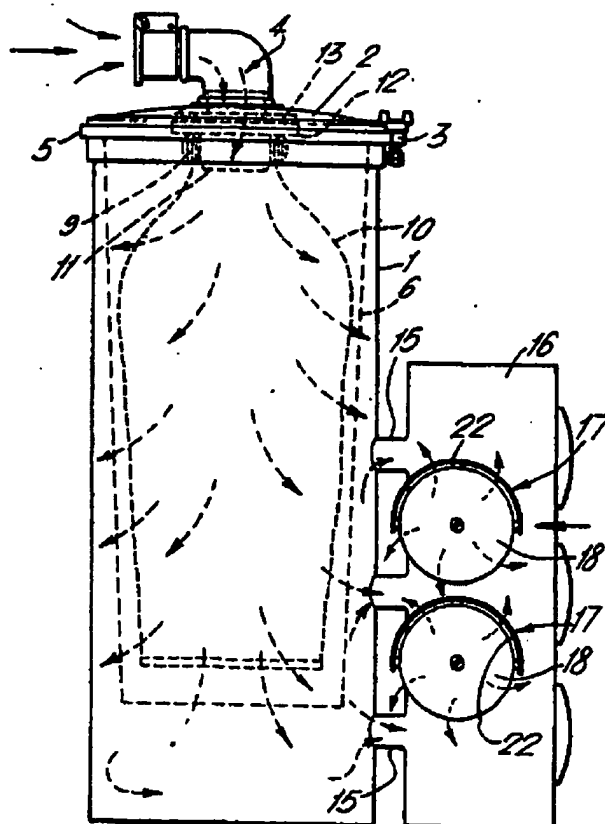
COMPLETE SPECIFICATION

3 SHEETS

This drawing is a reproduction of  
the Original on a reduced scale

Sheet 1

FIG.1.



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